

Culture of spotted seatrout *Cynoscion nebulosus* in a closed, recirculating system

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- Most popular gamefish in MS
- Estuarine life cycle
 - Pressure from habitat destruction, pollution, fishing
- GCRL, Mississippi Department of Marine Resources, Coast Conservation Association, etc...
- 2004

SPEC Objectives

- **Develop the methods to acquire, maintain and tank spawn broodstock of spotted seatrout**
- **Intensively produce, rear, tag, release, and monitor juveniles after release**
- **Test whether or not hatchery-raised fish can enhance the seatrout population in Mississippi**

SPEC Program

- **Broodstock Acquisition**
- **Quarantine and biosecurity**
- **Maturation/spawning**
- **Larviculture**
- **Tagging, release, and assessment**

Broodstock Acquisition

- Hook-and-line
- Barb-less hooks
- Soft catch-and release nets, plastic-lined nets, holding pens
- Coolers for transport
- Stress-coat, O₂
- Never out of the water



Quarantine and Biosecurity

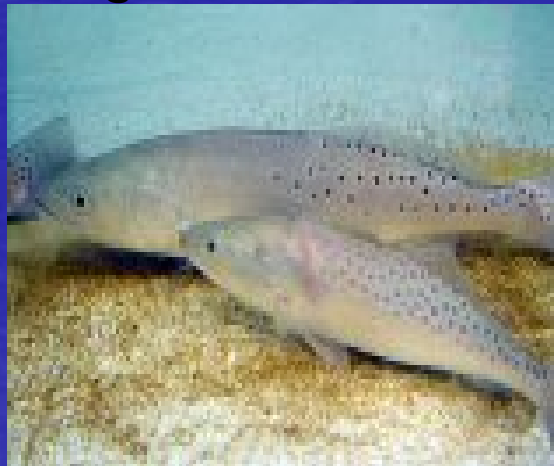
- Maximize spawning potential
- Exclude diseases
 - All fish have parasites
 - Concerned with fish to fish spread
 - Captivity facilitates spread
- Keep diseases out
 - Sanitation
 - Access control
 - Equipment control



Primary – few days → Freshwater Dip

↙ Secondary - treatments, feeding - ~ 30 days

Drug Treatment →



Maturation

- ~50 animals
- 2 tanks for spawning (20 each; 1♀:1♂)
- Fed shrimp, squid, cigar minnows at 3% bw three times per week
- Temperature and photoperiod cycle to mimic natural cycle



Larviculture

- **Standard**
 - Egg collecting
 - Incubating
 - Hatchery
- **Extensive**
 - Pond
- **Intensive**
 - Early larval rearing
 - Nursery
 - Growout
- **Sea trout typically extensive**



Hatchery (early larval rearing) Protocol

- Initial static system w/background algae – circulation slowly added
- ss-rotifers (enriched)
- Cultured copepod nauplii supplement
- *Artemia* nauplii (enriched)
- dry food early starting with 00-mash

copepods

Dry (start w/00 mash)

rotifers

Artemia

Algae

Day 0

↑
circulation

Day 12

Day 25

ELR

- ~25% survival to day 25 PH
- Average size ~17 mm
 - Normal
- System worked

< 1 mm

18 5:50 AM

Day 1
~2 mm

17 7:07 AM

Day 10
~5 mm

28 10:38 AM

Day 15
~10 mm

3 9:38 AM

Cannibalism
Day 15

5 9:45 AM

Day 25

Nursery

- 10-14 days
- Dry food/high circulation
- Density experiment (0.8 – 3.5 fish/liter)
- Survival inversely related to density
- Average 88% survival (79-95)
 - Minimal cannibalism
- High density may be OK
- ~45mm at day 38 PH

16 12:38 PM

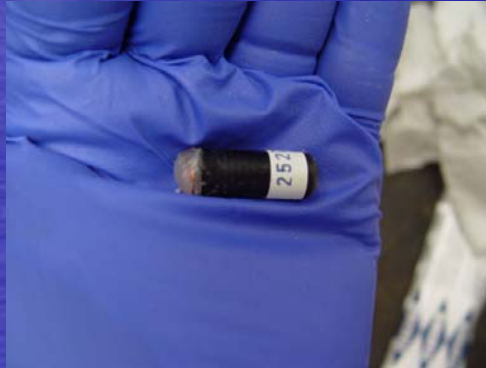
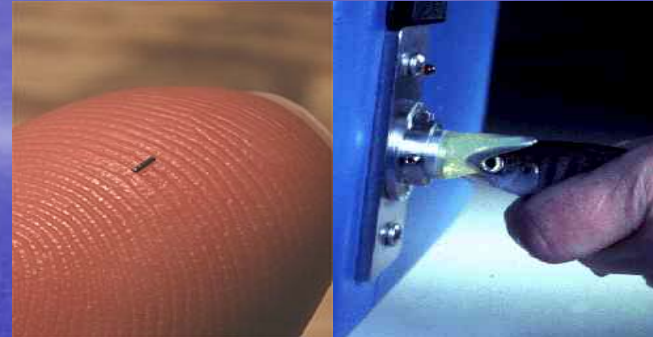
Growout

- 80-100mm at ~day 60
- Estimated 75% survival



Tagging (proposed)

- Coded-wire tags
- Elastomer
- Acoustic



Release and Assessment (proposed)

- Release method
- Survival, percent recovered, movement, effect of size-at-release
- Genetic issues
 - Release site?
 - match with origin of broodstock



Summary

- **Collection and quarantine system**
- **Husbandry procedures for broodstock development**
 - Fish near spawning when lost
- **Live food production**
- **Functional larval rearing protocol**
 - Intensive culture works
 - Identified things to do differently
- **Modifying facilities to reestablish program**
- **Reacquiring broodstock**